Let K be a compact Lie group (or a finite group, if one desires) and assume that K acts linearly on $W := \mathbb{R}^n$. An important question is to determine the quotient space of the K-action on W. Abstractly, the quotient space (denoted W/K) is the space of K-orbits in W and it is given the quotient topology. One can even give W/K a smooth structure by declaring that the C^∞ functions on W/K are $C^\infty(W)^K$, the K-invariant smooth functions on W. We will show that W/K is naturally (almost) an algebraic set X and that $C^\infty(W)^K \simeq C^\infty(X)$ (where we will define the latter). Finally, we will describe some results which allow one to find the equations which describe X. We will give lots of examples. One can first wonder about the case where $K = \{\pm 1\}$ acting by multiplication on $\mathbb{R}^1$.